How to Migrate to the z/VM Virtual Switch

Session V29

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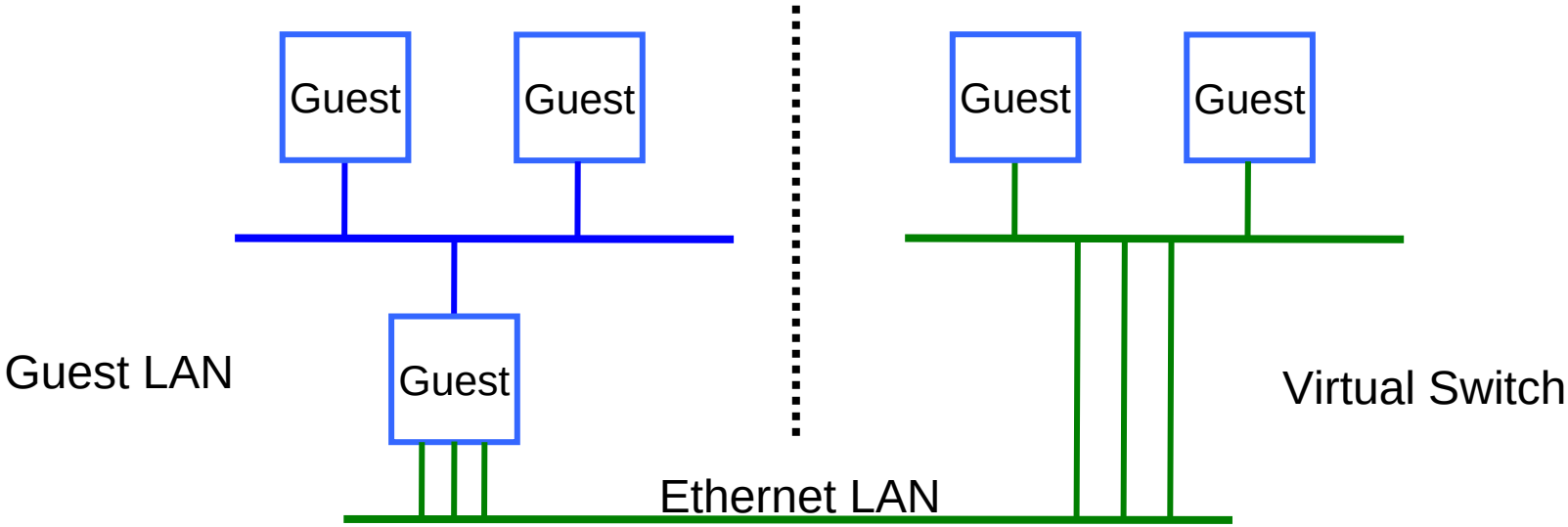
Topics

- Routing vs. Bridging
- What's a switch?
- VLAN-unaware migration
- VLAN-aware migration

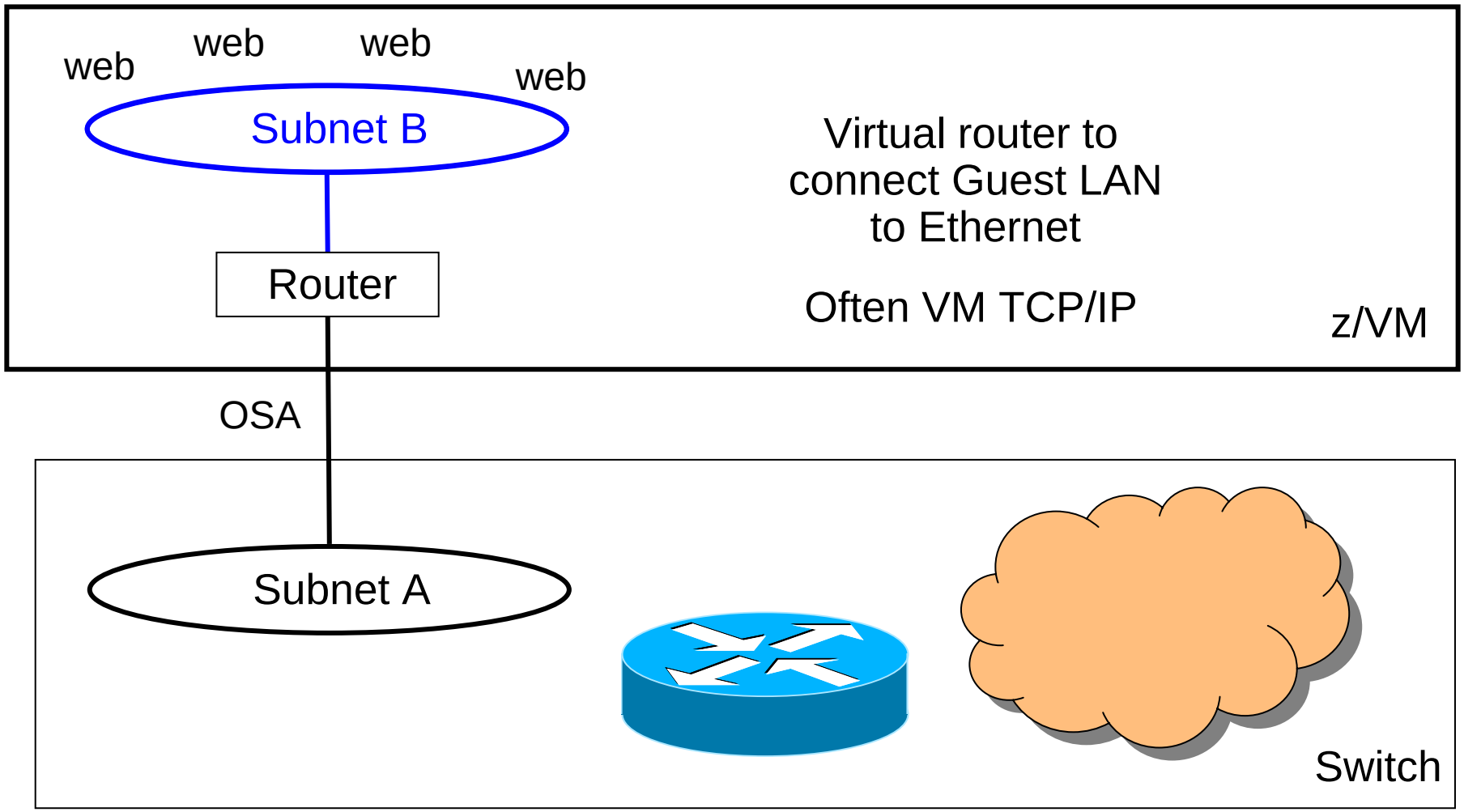
Review: Guest LAN vs. Virtual Switch



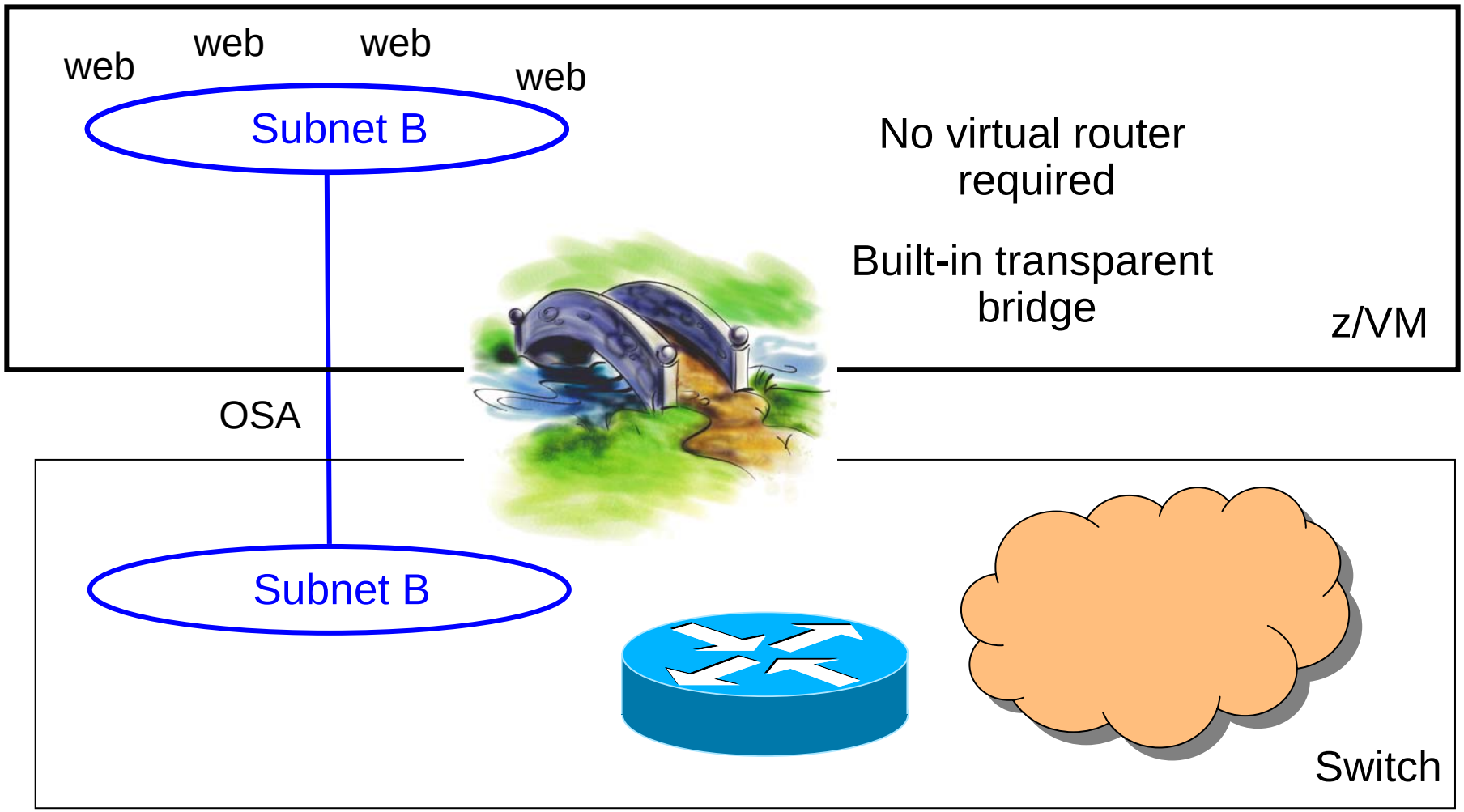
- Virtual router is required
- Different subnet
- External router awareness
- Guest-managed failover

- No virtual router
- Same subnet
- Transparent bridge
- CP-managed failover

A routed Guest LAN



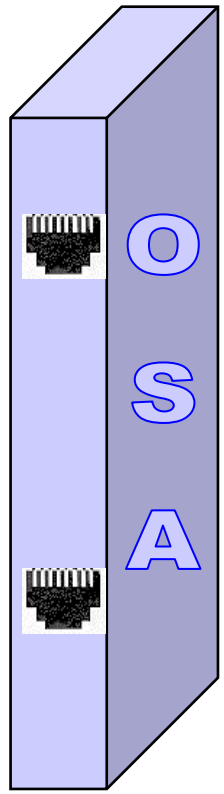
A bridged Guest LAN using VSWITCH



What's a switch?

© Cisco Corp

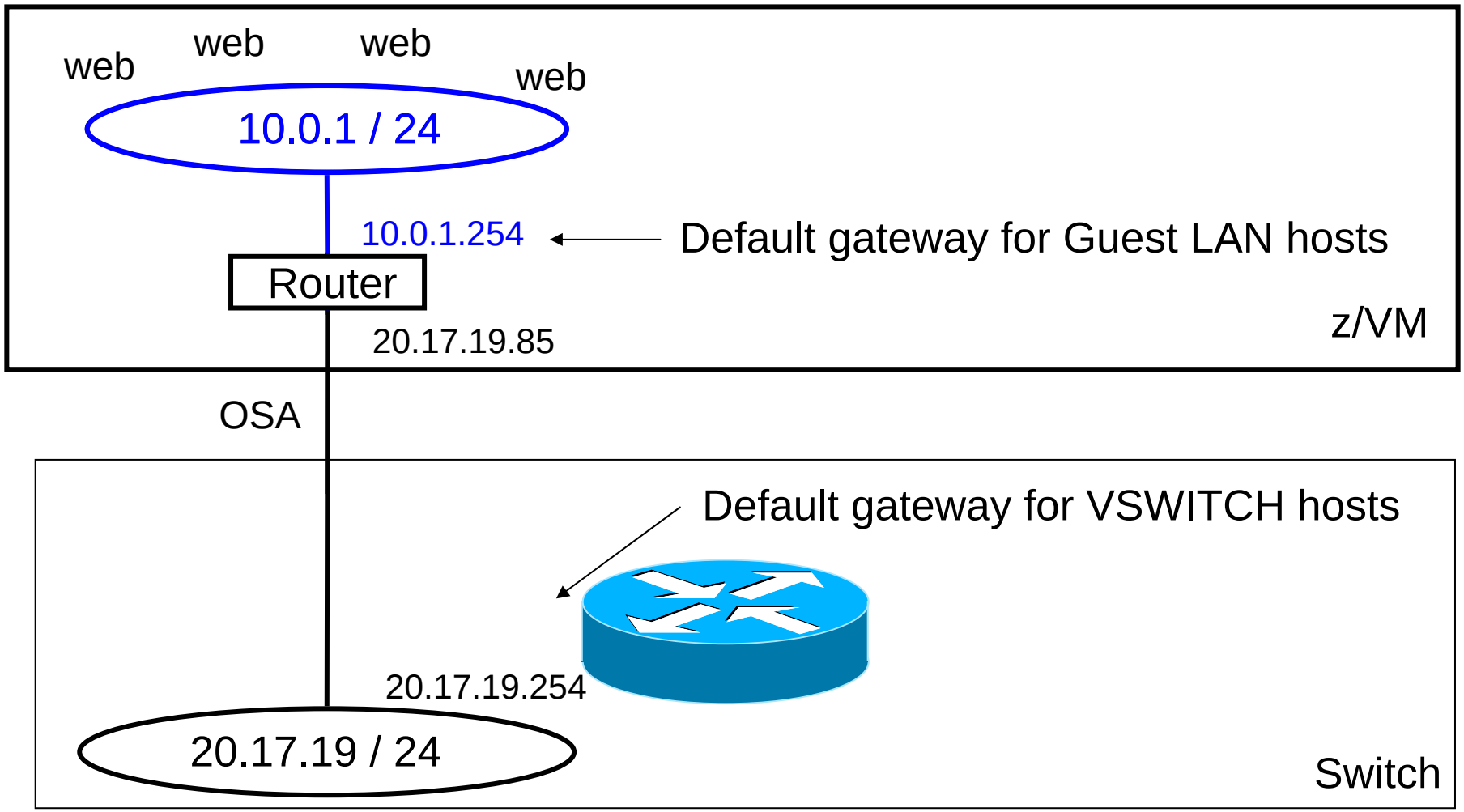
- A box that creates a LAN
- It can be remotely configured
  - E.g. Turn ports on and off
- Contains a built-in router



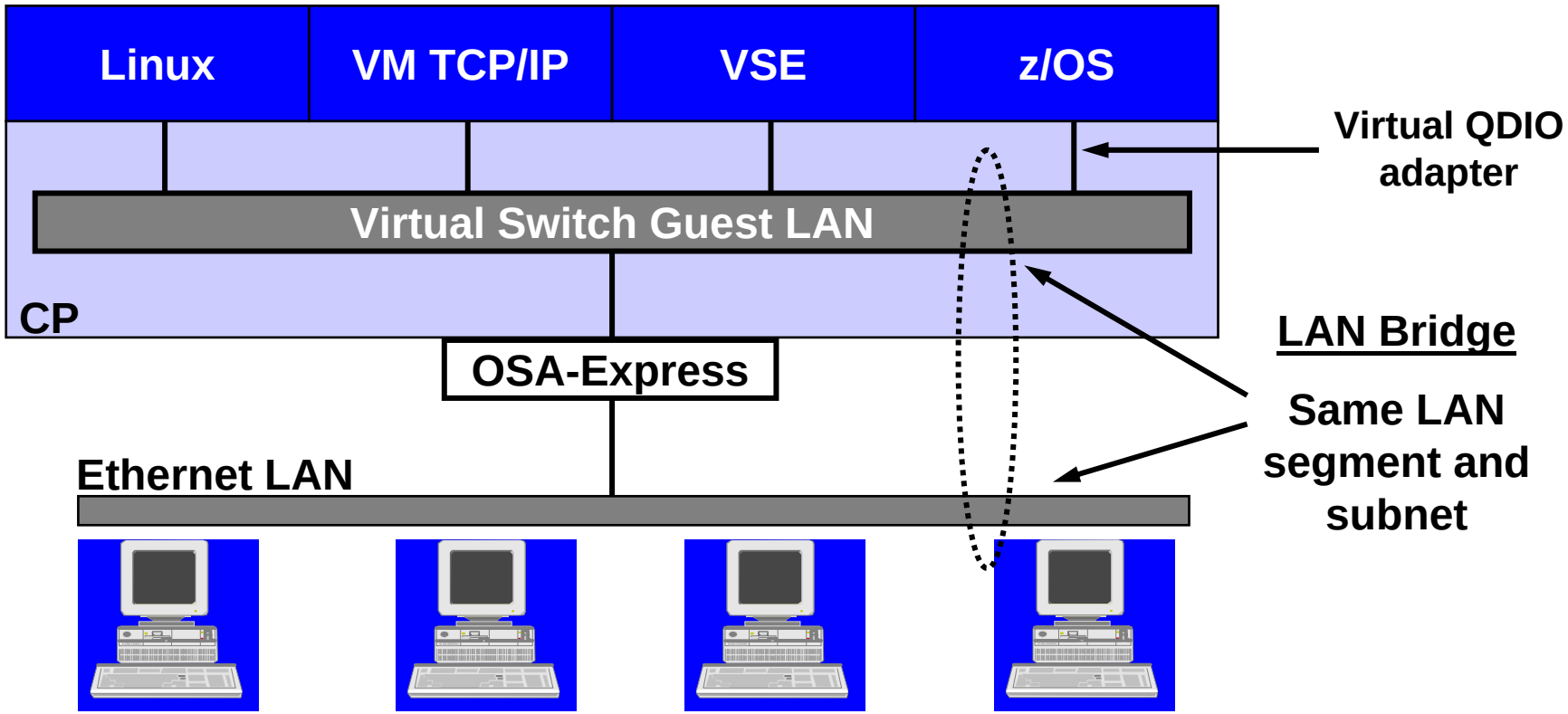
Switch functions

- Enable and disable a port
- Set port type: trunk or access
- Assign port to one or more VLANs
- Set port speed: 10 / 100 / 1000 / Auto
- Set port duplex mode: Simplex / Duplex / Auto
- Define an internal router
- Define SNAP (sniffer) ports

A routed Guest LAN



z/VM Virtual Switch – VLAN unaware



Current Configuration

Current Cisco 6509 Switch Configuration

- OSA is plugged into **port 7** of **slot 2**
- Port is defined as an **access** port
  - VLAN **un**aware host
- Port is currently assigned to **VLAN 201**
  - While in ENABLE mode:

```
#set vlan 201 name vlan201 mtu 1500
#set vlan 201 2/7
```

  - While in CONFIG mode:

```
#interface vlan 201
#ip address 20.17.19.254 255.255.255.0
```

CP – SYSTEM CONFIG

```
DEFINE LAN WEBNET TYPE QDIO RESTRICTED
MODIFY LAN WEBNET GRANT LINUX001
MODIFY LAN WEBNET GRANT LINUX002
MODIFY LAN WEBNET GRANT LINUX003
MODIFY LAN WEBNET GRANT LINUX004
MODIFY LAN WEBNET GRANT TCPIP
```

VM TCP/IP directory

```
USER TCPIP XXXXXXXX 32M 128M ABG
  :
* Guest LAN
 NICDEF E00  TYPE QDIO  LAN SYSTEM WEBNET
* OSA
 DEDICATE C200 C200
 DEDICATE C201 C201
 DEDICATE C202 C202
:
```

VM TCP/IP Profile

```
; Syntax is z/VM 5.2
; eth0 is the external OSA
  DEVICE ETH0 OSD C200
  LINK   ETH0  QDIOETHERNET ETH0  MTU 1500

; eth1 is Guest LAN
  DEVICE ETH1 OSD E00
  LINK   ETH1  QDIOETHERNET ETH1  MTU 1500

  HOME
       20.17.19.85/24   ETH0
       10.0.1.254/24    ETH1

 GATEWAY
       defaultnet  20.17.19.254  ETH0 0
```

Linux directory entry

```
USER LINUX002 XXXXXXXX 128M 2048M G
  :
* Guest LAN
 NICDEF C204  TYPE QDIO  LAN SYSTEM WEBNET
  :
```

Linux configuration - network

- ifconfig eth0 10.0.1.5 mask 255.255.255.0 mtu 1500
- route add default gw 10.0.1.254

New Configuration #1

Methodology #1

- Create a new VLAN in the Cisco switch to carry the subnet being moved
- Associate the OSA with the new VLAN
- Add a new router to the switch
- Delete the router from z/VM
- Connect the VSWITCH

Cisco Catalyst 6509 (running CatOS)

- While in ENABLE mode:

```
#set vlan 202 name webnet mtu 1500
#set vlan 202 2/7
```

- While in CONFIG mode:

```
#interface vlan 202
#ip address 10.0.1.254 255.255.255.0
```

- If you do not have a router function in your switch
  - add another interface on your router
  - plug it into another port
  - add the new port to vlan 202

CP – SYSTEM CONFIG

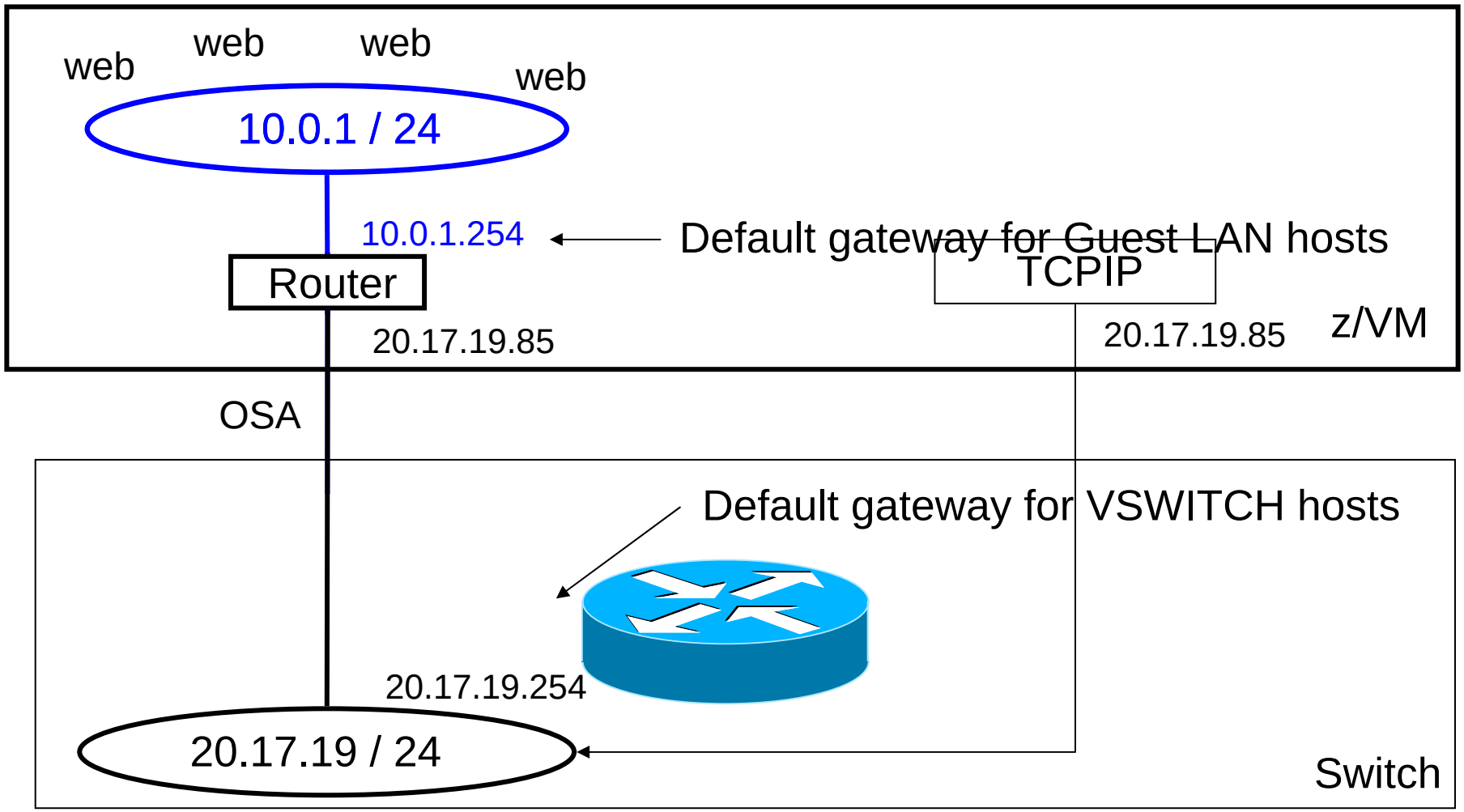
```
* from Guest LAN…
DEFINE LAN WEBNET RESTRICTED TYPE QDIO
MODIFY LAN WEBNET GRANT LINUX001
MODIFY LAN WEBNET GRANT LINUX002
MODIFY LAN WEBNET GRANT LINUX003
MODIFY LAN WEBNET GRANT LINUX004
MODIFY LAN WEBNET GRANT TCPIP

*  …to VLAN-unaware VSWITCH
DEFINE VSWITCH WEBNET RDEV C200
MODIFY VSWITCH WEBNET GRANT LINUX001
MODIFY VSWITCH WEBNET GRANT LINUX002
MODIFY VSWITCH WEBNET GRANT LINUX003
MODIFY VSWITCH WEBNET GRANT LINUX004
```

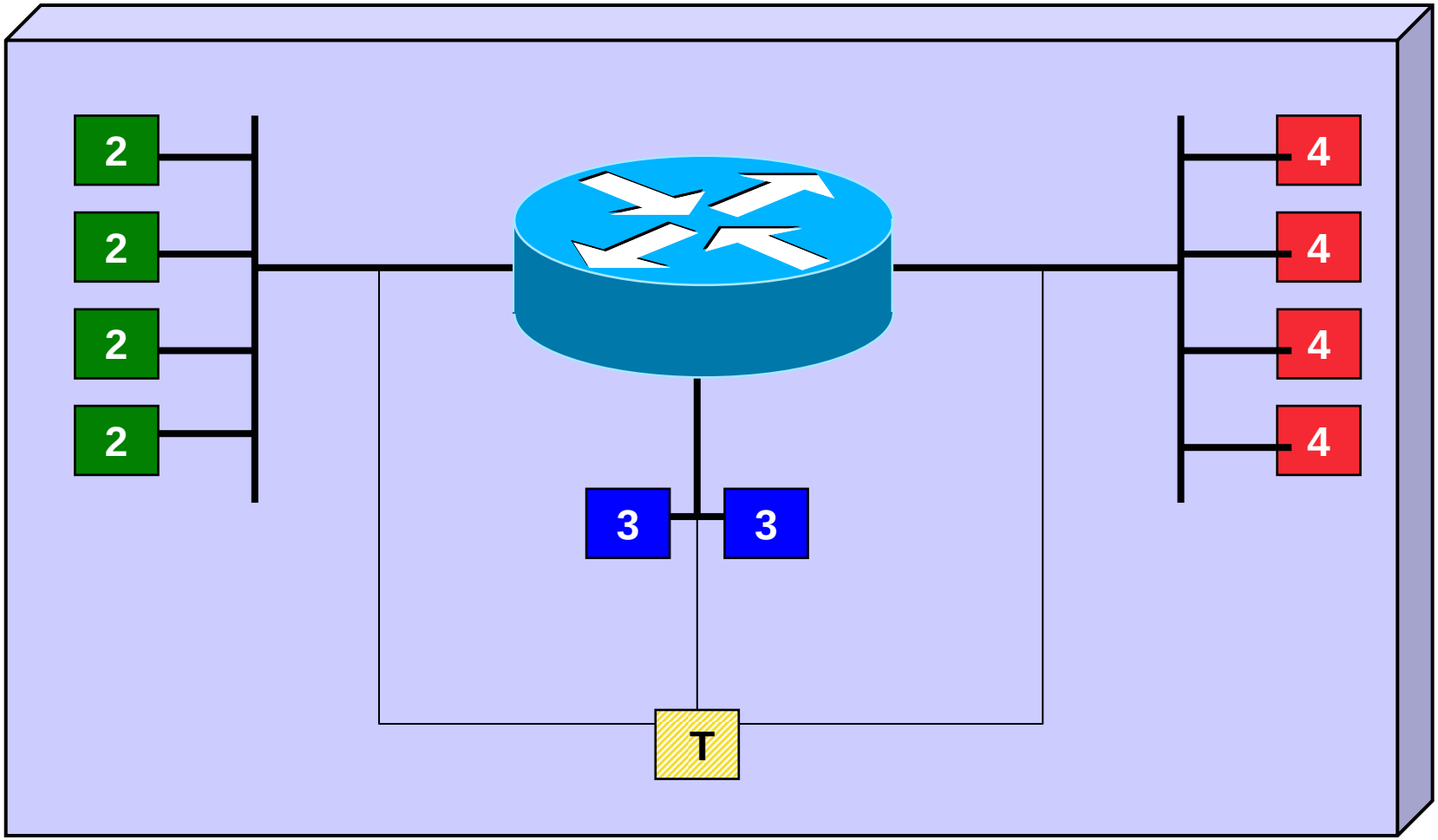
Note that TCPIP is not in the access list on the VSWITCH

But I want to keep TCP/IP...

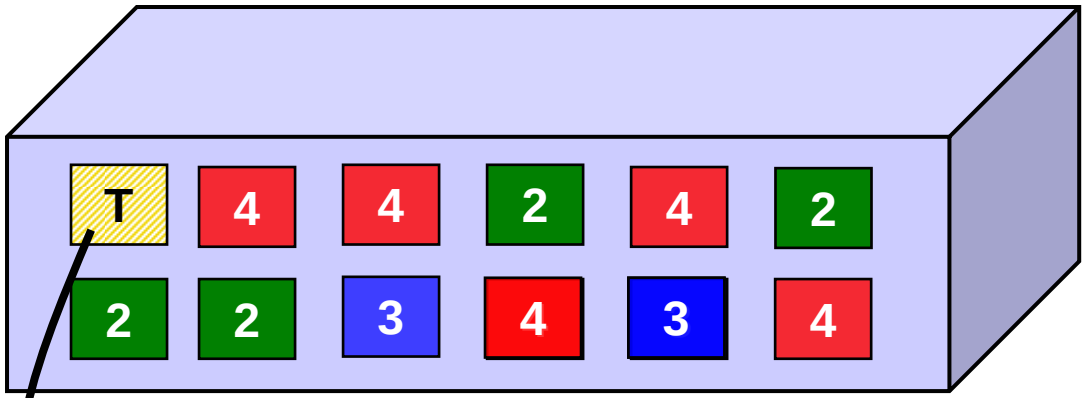
A routed Guest LAN



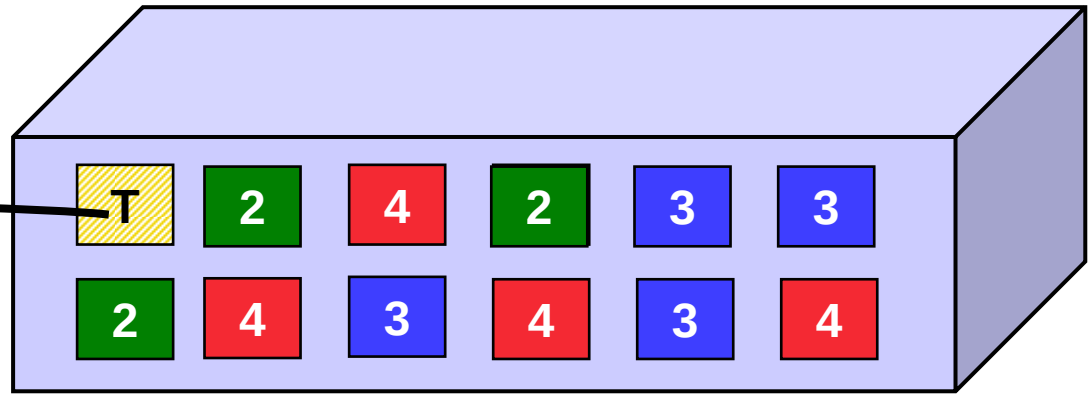
A VLAN-aware switch: An inside look



Trunk Port vs. Access Port

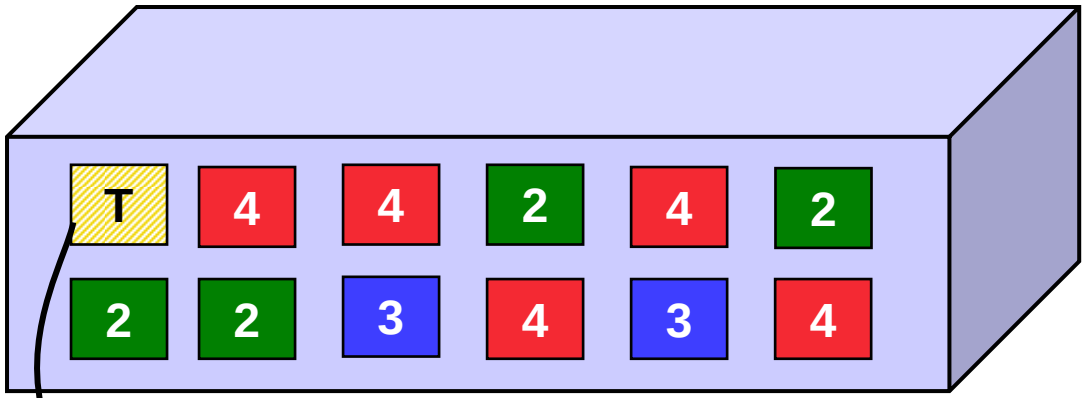


- Access port carries traffic for a single VLAN
- Host not aware of VLANs



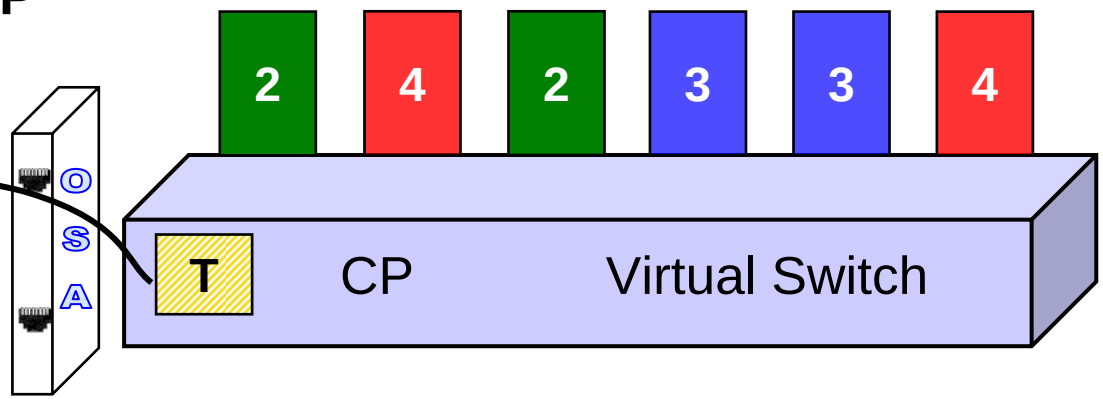
- Trunk port carries traffic from all VLANs
- Every frame is tagged with the VLAN id

Physical Switch to Virtual Switch

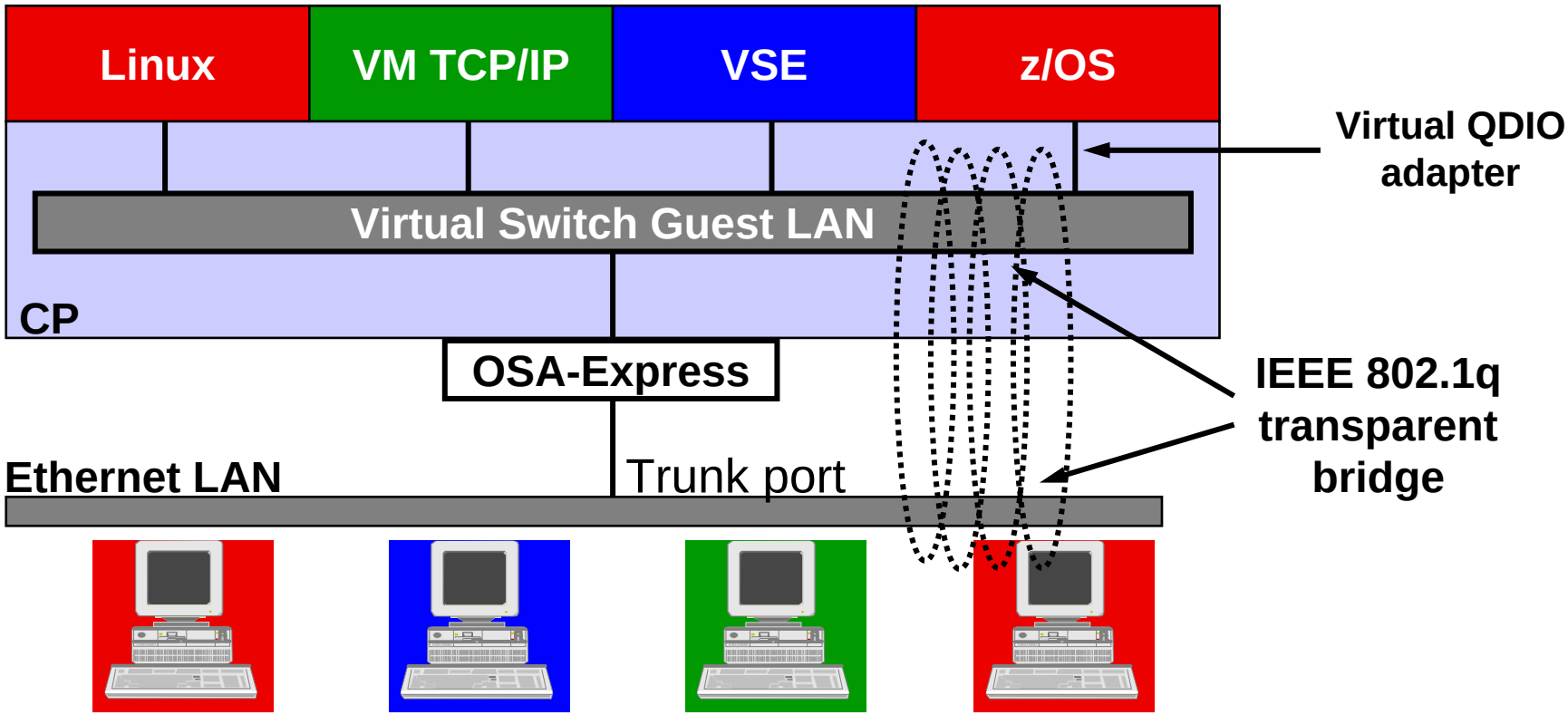


- **Trunk port carries traffic between CP and switch**

- **Each guest can be in a different VLAN**



z/VM Virtual Switch – VLAN aware



New Configuration #2

Methodology #2

- Use a single OSA port to carry traffic for both VM TCP/IP and the Linux guests
- Use a VLAN-aware VSWITCH
- Add a new router to the switch
- Allow VLAN tags for both subnets to flow on the OSA port

CP – SYSTEM CONFIG

```
* from a Guest LAN…
DEFINE LAN WEBNET RESTRICTED TYPE QDIO
MODIFY LAN WEBNET GRANT LINUX001
MODIFY LAN WEBNET GRANT LINUX002
MODIFY LAN WEBNET GRANT LINUX003
MODIFY LAN WEBNET GRANT LINUX004
MODIFY LAN WEBNET GRANT TCPIP

* …to a VLAN-aware VSWITCH
DEFINE VSWITCH WEBNET RDEV C200 VLAN 1
MODIFY VSWITCH WEBNET GRANT LINUX001 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX002 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX003 VLAN 202
MODIFY VSWITCH WEBNET GRANT LINUX004 VLAN 202
MODIFY VSWITCH WEBNET GRANT TCPIP VLAN 201
```

The native VLAN id of the switch should match the VLAN specified on DEFINE VSWTICH

Cisco Catalyst 6509 (running CatOS)

- While in ENABLE mode:

```
#set vlan 202 name webnet mtu 1500
#set trunk 2/7 on dot1q 1,201-202
```

- While in CONFIG mode:

```
#interface vlan 202
#ip address 10.0.1.254 255.255.255.0
```

- If you do not have a router function in your switch
  - add another interface on your router
  - plug it into another port
  - add the new port to vlan 202

VM TCP/IP directory

```
USER TCPIP XXXXXXXX 32M 128M ABG
  :
* Virtual Switch
 NICDEF C200  TYPE QDIO  LAN SYSTEM WEBNET
```

VM TCP/IP Profile

```
; Syntax is z/VM 5.2
; eth0 is the external OSA
  DEVICE ETH0 OSD C200
  LINK   ETH0  QDIOETHERNET ETH0  MTU 1500


  HOME
       20.17.19.85/24   ETH0

 GATEWAY
       defaultnet  20.17.19.254  ETH0 0
```

Conclusion

Summary

- Conversion is relatively easy
- Draw pictures
- There are choices:
  - Separate OSA ports, each assigned to a separate VLAN
  - A single OSA port that trunks multiple VLANs
  - A combination

Thanks for Listening!

Contact Information

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